

**Remarks**

**A. Claims in the Case**

Claims 309, 311-321, 323, 324, and 326-341 are currently pending.

**B. The Claims Are Not Anticipated by Grow Pursuant To 35 U.S.C. § 102(e)**

Claims 309, 311-319, 323, 326, 330, 332-335, 337-339, and 341 were rejected pursuant to 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 5,866,430 to Grow (hereinafter "Grow"). Applicant respectfully disagrees that the claims are anticipated by Grow.

The standard for "anticipation" is one of fairly strict identity. To anticipate a claim of a patent, a single prior source must contain all the claimed essential elements. *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 231 U.S.P.Q.81, 91 (Fed.Cir. 1986); *In re Donahue*, 766 F.2d 531, 226 U.S.P.Q. 619, 621 (Fed.Cir. 1985).

Independent claim 309 includes a combination of features including, but not limited to, the features of:

a cartridge, wherein the cartridge is configured to be removably positionable in the body, and wherein the cartridge comprises a cartridge body and a sensor array disposed within the cartridge body, and wherein the sensor array comprises:

a supporting member comprising at least one cavity formed within the supporting member;

a particle, wherein the particle is positioned in the cavity, and wherein the particle comprises a receptor coupled to a polymeric bead, and wherein the particle is configured to produce a signal when the particle interacts with an analyte during use, and wherein the cavity is configured such that a particle is substantially contained within the cavity during use;

Applicant's Specification states: "In an embodiment of a system for detecting analytes, the system, in some embodiments, includes a light source, a sensor array, and a detector. The sensor array, in some embodiments, is formed of a supporting member which is configured to hold a variety of chemically sensitive particles (herein referred to as "particles") in an ordered array." (Specification, p. 7, lines 23-26) Applicant's Specification further states: "In an embodiment, the sensor array system includes an array of particles... The supporting member, in some embodiments, is used to localize these particles as well as to serve as a microenvironment in which the chemical assays can be performed... To accommodate these changes, it is preferred that the supporting member consist of an array of cavities which serve as micro test-tubes." (Specification, p. 21, lines 4-14). "In one embodiment, the supporting member includes a plurality of cavities. The cavities may be formed such that at least one particle is substantially contained within the cavity." (Specification, p. 21, lines 20-22). "The cavities 230 may be sized to substantially contain a particle 235." (Specification, p. 23, line 4). (See FIGS. 1-3)

With regard to Grow, the Office Action states: "wherein the cartridge comprises a body (#56) and a sensor array (tape, filter or support Column 39, lines 1-61, Fig. 3) wherein the array comprises a supporting member and at least one cavity (interior space of the cassette as illustrated in Fig. 3) within the supporting member, a polymeric bead particle positioned in the cavity and having a receptor bound thereto...." Applicant submits that the interior space of the cassette is not a cavity formed within a supporting member of a sensor array.

Referring to Figures 3a-3e, Grow states:

The cassette 55 is mounted in a modular housing 56. In the cassette are a tape supply spool 62 and a take up spool 64, as shown. The cassette 5 includes a sample window 68 permitting exposure of a tape section 66 to the liquid, and an exhaust chamber 69 through which the liquid is drawn by the pump.  
(Grow, col. 39, lines 3-8)

As shown in FIGS. 3c and 3d, the take up spool is mounted on support rod 80, the latter including a spring biasing means 81 tending to wind up the take up reels. The other end of the rod 80 includes a rotation impeder 82 which fits in a notch of the rod. When the impeder is released the spring caused the rod to rotate

a predetermined amount to bring a fresh section of each tape under the window 68. As shown the tape supply spool is also supported by a support rod 84.  
(Grow, col. 39, lines 16-24)

While a single tape coated with one strip of immobilized bioconcentrator is shown, it is apparent that multiple strips or arrays of spots of immobilized bioconcentrators may be used on a single tape....  
(Grow, col. 39, lines 38-41)

Grow appears to teach a cassette with an interior space for positioning of the tape ("sensor array", as identified in the Office Action) in the cassette, with the supply spool and take up spools mounted on support rods. Grow appears to teach a cassette mounted in a modular housing. Grow also appears to teach a tape supply spool and take up spool in the cassette. Grow does not appear to teach a cavity in a portion of the sensor array. Grow does not appear to teach or suggest "a sensor array ... wherein the sensor array comprises: a supporting member comprising at least one cavity formed within the supporting member" and "a particle, wherein the particle is positioned in the cavity".

Grow states:

If immobilized on a substrate, the surface on which (or film or material within which) the bioconcentrator is immobilized may be of virtually any material with which the bioconcentrator, analyte(s), and sample(s) are physically and chemically compatible, and may be in any of a wide variety of configurations, such as badges, tickets, dipsticks, small spots on paper, plastic, polymer, cloth, or other material, optical fibers or crystals, small beads, glass slides, tubes, metal films, paper or plastic tapes, and so forth.  
(Grow, col 21, lines 17-25)

Grow appears to teach a bioconcentrator immobilized on a substrate. Grow does not appear to teach or suggest at least the features of claim 309 including, but not limited to: "a sensor array ... wherein the sensor array comprises: a supporting member comprising at least one cavity formed within the supporting member" and "a particle, wherein the particle is positioned in the cavity".

Grow states:

FIGS. 6a and 6b illustrate a sampling system 425 in the form of a relatively flat supporting member 426, having at least one surface 428 to which a bioconcentrator is immobilized. The bioconcentrator may be any of the materials previously mentioned, or any combination thereof; and may be adsorbed, cross-linked, covalently bound to, or entrapped on the surface of the supporting member. The supporting member may be rigid or flexible and may even be porous, e.g., metallized filter paper; the supporting member may be transparent to the radiation to which it is exposed, e.g., an optical waveguide plate or crystal, thus allowing the radiation to be projected from the underside 429 of the bioconcentrator.... A preferred manner in which to provide a roughened surface is illustrated in FIG. 6c in which the sampling system 425 includes a supporting member 426, already described. Here, at least a portion of the surface of the supporting member includes a plurality of microspheres 468. These microspheres may be, for example, polystyrene, polyvinyltoluene, polybutadiene, Teflon, aluminum, platinum, or zirconium, having diameters in the range from 100 Å to tens of thousands Å; however, in general, roughness protrusions 5 to 500 nm may be preferred. The beaded surface is then coated with a sputter-deposited metal film 469, preferably silver, copper, or gold. The bioconcentrator may then be affixed to the roughened metal surface as already described.  
(Grow, col. 43, line 67 through col. 44, line 28)

Grow appears to teach a bioconcentrator immobilized on a supporting member. Grow does not appear to teach or suggest “a sensor array ... wherein the sensor array comprises: a supporting member comprising at least one cavity formed within the supporting member” and “a particle, wherein the particle is positioned in the cavity”. Applicant submits claim 309 is patentable over Grow. Applicant respectfully requests removal of the rejection of claim 309 and the claims dependent thereon.

The Office Action includes a rejection of claim 311 in view of Grow. Claim 311 states in part: “further comprising a sample input port, wherein the sample input is positioned on the body, and wherein the sample input port is coupled to the sensor array such that samples introduced into the input port are transferred to the sensor array.” Applicant respectfully submits that the cited art does not teach or suggest the features of claim 311 in combination with the features of claim 309.

The Office Action includes a rejection of claim 312 in view of Grow. Claim 312 states in part: “further comprising a sample input port, wherein the sample input is positioned on the body, and wherein the sample input port is coupled to the sensor array such that samples introduced into the input port are transferred to the sensor array, and wherein the sample input port is configured to receive a syringe.” Grow does not appear to teach or suggest a sample input port configured to receive a syringe. Applicant respectfully submits that the cited art does not teach or suggest the features of claim 312 in combination with the features of claim 309.

The Office Action includes a rejection of claim 313 in view of Grow. Claim 313 states in part: “further comprising a sample input port and a filter, wherein the sample input is positioned on the body, and wherein the sample input port is coupled to the sensor array such that samples introduced into the input port are transferred to the sensor array, and wherein the filter is coupled to the sample input port.” Applicant respectfully submits that the cited art does not teach or suggest the features of claim 313 in combination with the features of claim 309.

The Office Action includes a rejection of claim 314 in view of Grow. Claim 314 states in part: “further comprising a fluid cartridge coupled to the body and the sensor array.” Grow does not appear to teach or suggest a fluid cartridge coupled to the body. Applicant respectfully submits that the cited art does not teach or suggest the features of claim 314 in combination with the features of claim 309.

The Office Action includes a rejection of claim 315 in view of Grow. Claim 315 states in part: “further comprising an electronic controller disposed in the body and coupled to the sensor array, the light source, and the detector; wherein the electronic controller is configured to control the operation of the sensor array system.” Applicant respectfully submits that the cited art does not teach or suggest the features of claim 315 in combination with the features of claim 309.

The Office Action includes a rejection of claim 316 in view of Grow. Claim 316 states in part: “further comprising a global positioning system coupled to the body.” Grow does not appear to teach or suggest a global positioning system coupled to the body. Applicant

respectfully submits that the cited art does not teach or suggest the features of claim 316 in combination with the features of claim 309.

The Office Action includes a rejection of claim 317 in view of Grow. Claim 317 states in part: "further comprising a data transfer system." Applicant respectfully submits that the cited art does not teach or suggest the features of claim 317 in combination with the features of claim 309.

The Office Action includes a rejection of claim 318 in view of Grow. Claim 318 states in part: "wherein the detector comprises a monochrome detector." Grow does not appear to teach or suggest a monochrome detector. Applicant respectfully submits that the cited art does not teach or suggest the features of claim 318 in combination with the features of claim 309.

The Office Action includes a rejection of claim 319 in view of Grow. Claim 319 states in part: "wherein the detector comprises a color detector." Grow does not appear to teach or suggest a color detector. Applicant respectfully submits that the cited art does not teach or suggest the features of claim 319 in combination with the features of claim 309.

The Office Action includes a rejection of claim 323 in view of Grow. Claim 323 states in part: "further comprising a fluid delivery system coupled to the supporting member." Grow does not appear to teach or suggest a fluid delivery system. Applicant respectfully submits that the cited art does not teach or suggest the features of claim 323 in combination with the features of claim 309.

The Office Action includes a rejection of claim 326 in view of Grow. Claim 326 states in part: "wherein the system comprises a plurality of particles positioned within a plurality of cavities, and wherein the system is configured to substantially simultaneously detect a plurality of analytes in the fluid." As stated above, Grow does not appear to teach or suggest a plurality of particles positioned within a plurality of cavities. Applicant respectfully submits that the cited art does not teach or suggest the features of claim 326 in combination with the features of claim 309.

The Office Action includes a rejection of claim 330 in view of Grow. Claim 330 states in part: “wherein the particles further comprises an indicator, wherein the indicator is associated with the receptor such that in the presence of the analyte the indicator is displaced from the receptor to produce the signal.” Applicant respectfully submits that the cited art does not teach or suggest the features of claim 330 in combination with the features of claim 309.

The Office Action includes a rejection of claim 332 in view of Grow. Claim 332 states in part: “wherein the supporting member further comprises channels in the supporting member, wherein the channels are configured to allow the fluid to flow through the channels into and away from the cavity.” Applicant respectfully submits that the cited art does not teach or suggest the features of claim 332 in combination with the features of claim 309.

The Office Action includes a rejection of claim 333 in view of Grow. Claim 333 states in part: “wherein the supporting member further comprises a barrier layer positioned over the cavity, wherein the barrier layer is configured to inhibit dislodgment of the particle during use.” Grow describes a cassette including a sample window. As stated above, Grow does not appear to teach or suggest a supporting member comprising at least one cavity formed within the supporting member and a particle, wherein the particle is positioned in the cavity. Grow does not appear to teach or suggest a barrier layer configured to inhibit dislodgment of a particle during use. Grow does not appear to teach or suggest a barrier layer positioned over a cavity formed within a supporting member of a sensor array. Applicant respectfully submits that the cited art does not teach or suggest the features of claim 333 in combination with the features of claim 309.

The Office Action includes a rejection of claim 334 in view of Grow. Claim 334 states in part: “wherein the supporting member further comprises a barrier layer positioned over the cavity, wherein the barrier layer is configured to inhibit dislodgment of the particle during use, and wherein the barrier layer comprises a substantially transparent cover plate positioned over the cavity, and wherein the barrier layer is positioned such that a channel is formed between an upper surface of the supporting member and the barrier layer, and wherein the fluid passes

through the channel during use.” As stated above, Grow does not appear to teach or suggest a supporting member comprising at least one cavity formed within the supporting member and a particle, wherein the particle is positioned in the cavity. Grow does not appear to teach or suggest a barrier layer configured to inhibit dislodgment of a particle during use. Grow does not appear to teach or suggest a barrier layer positioned over a cavity formed within a supporting member of a sensor array. Grow does not appear to teach or suggest a supporting member of a sensor array further comprising a barrier layer, wherein fluid passes through a channel formed between an upper surface of the supporting member and the barrier layer during use. Applicant respectfully submits that the cited art does not teach or suggest the features of claim 334 in combination with the features of claim 309.

The Office Action includes a rejection of claim 335 in view of Grow. Claim 335 states in part: “wherein the supporting member comprises a plastic material.” Applicant respectfully submits that the cited art does not teach or suggest the features of claim 335 in combination with the features of claim 309.

The Office Action includes a rejection of claim 337 in view of Grow. Claim 337 states in part: “wherein the cavity is configured such that the fluid entering the cavity passes through the cavity during use.” As stated above, Grow does not appear to teach or suggest a supporting member comprising at least one cavity formed within the supporting member and a particle, wherein the particle is positioned in the cavity. Applicant respectfully submits that the cited art does not teach or suggest the features of claim 337 in combination with the features of claim 309.

The Office Action includes a rejection of claim 338 in view of Grow. Claim 338 states in part: “further comprising a pump coupled to the supporting member, wherein the pump is configured to direct the fluid towards the cavity.” Applicant respectfully submits that the cited art does not teach or suggest the features of claim 338 in combination with the features of claim 309.

The Office Action includes a rejection of claim 339 in view of Grow. Claim 339 states in part: “wherein a channel is formed in the supporting member, wherein the channel couples a



through the channel during use.” As stated above, Grow does not appear to teach or suggest a supporting member comprising at least one cavity formed within the supporting member and a particle, wherein the particle is positioned in the cavity. Grow does not appear to teach or suggest a barrier layer configured to inhibit dislodgment of a particle during use. Grow does not appear to teach or suggest a barrier layer positioned over a cavity formed within a supporting member of a sensor array. Grow does not appear to teach or suggest a supporting member of a sensor array further comprising a barrier layer, wherein fluid passes through a channel formed between an upper surface of the supporting member and the barrier layer during use. Applicant respectfully submits that the cited art does not teach or suggest the features of claim 334 in combination with the features of claim 309.

The Office Action includes a rejection of claim 335 in view of Grow. Claim 335 states in part: “wherein the supporting member comprises a plastic material.” Applicant respectfully submits that the cited art does not teach or suggest the features of claim 335 in combination with the features of claim 309.

The Office Action includes a rejection of claim 337 in view of Grow. Claim 337 states in part: “wherein the cavity is configured such that the fluid entering the cavity passes through the cavity during use.” As stated above, Grow does not appear to teach or suggest a supporting member comprising at least one cavity formed within the supporting member and a particle, wherein the particle is positioned in the cavity. Applicant respectfully submits that the cited art does not teach or suggest the features of claim 337 in combination with the features of claim 309.

The Office Action includes a rejection of claim 338 in view of Grow. Claim 338 states in part: “further comprising a pump coupled to the supporting member, wherein the pump is configured to direct the fluid towards the cavity.” Applicant respectfully submits that the cited art does not teach or suggest the features of claim 338 in combination with the features of claim 309.

The Office Action includes a rejection of claim 339 in view of Grow. Claim 339 states in part: “wherein a channel is formed in the supporting member, wherein the channel couples a

pump to the cavity such that the fluid flows through the channel to the cavity during use.”

Applicant respectfully submits that the cited art does not teach or suggest the features of claim 339 in combination with the features of claim 309.

The Office Action includes a rejection of claim 341 in view of Grow. Claim 341 states in part: “wherein the sensor array is positioned within a cartridge, and wherein the cartridge is removable from the body.” Applicant respectfully submits that the cited art does not teach or suggest the features of claim 341 in combination with the features of claim 309.

**C. The Claims Are Not Unpatentable Over Grow In View Of Lavigne Pursuant To 35 U.S.C. § 103(a)**

Claims 324, 327-329, and 331 were rejected as being unpatentable pursuant to 35 U.S.C. § 103(a) over Grow in view of Lavigne et al. (J. Amer. Chem. Soc. 1998, 120, 6429-6430, hereinafter “Lavigne”). Applicant respectfully disagrees that the claims are unpatentable over Grow in view of Lavigne.

In order to reject a claim as obvious, the Examiner has the burden of establishing a *prima facie* case of obviousness. *In re Warner et al.*, 379 F.2d 1011, 154 USPQ 173, 177-178 (C.C.P.A. 1967). To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974), MPEP §2143.03.

For at least the reasons stated above, claim 309 is patentable over Grow.

Claim 324 states in part: “wherein the detector comprises a charge-coupled device.” For at least the reasons stated above, Applicant respectfully submits that the combination of the cited art does not teach or suggest the features of claim 324 in combination with the features of claim 309.

Claim 327 states in part: “wherein the particle ranges from about 0.05 micron to about 500 microns.” For at least the reasons stated above, Applicant respectfully submits that the combination of the cited art does not teach or suggest the features of claim 327 in combination with the features of claim 309.

Claim 328 states in part: “wherein a volume of the particle changes when contacted with the fluid.” For at least the reasons stated above, Applicant respectfully submits that the combination of the cited art does not teach or suggest the features of claim 327 in combination with the features of claim 309.

Claim 329 states in part: “wherein the particle further comprises a first indicator and a second indicator, wherein the first and second indicators are configured to be coupled to the receptor, wherein the interaction of the receptor with the analyte causes the first and second indicators to interact such that the signal is produced.” For at least the reasons stated above, Applicant respectfully submits that the combination of the cited art does not teach or suggest the features of claim 329 in combination with the features of claim 309.

Claim 331 states in part: “wherein the supporting member comprises silicon.” For at least the reasons stated above, Applicant respectfully submits that the combination of the cited art does not teach or suggest the features of claim 331 in combination with the features of claim 309.

**D. The Claims Are Not Unpatentable Over Grow Pursuant To 35 U.S.C. § 103(a)**

Claims 320 and 321 were rejected as being unpatentable pursuant to 35 U.S.C. § 103(a) over Grow. Applicant respectfully disagrees that the claims are unpatentable over Grow.

For at least the reasons stated above, claim 309 is patentable over Grow.

Claim 320 states in part: “wherein the light source comprises at least one light-emitting diode.” For at least the reasons stated above, Applicant respectfully submits that the cited art does not teach or suggest the features of claim 320 in combination with the features of claim 309.

Claim 321 states in part: “wherein the light source comprises a light emitting diode.” For at least the reasons stated above, Applicant respectfully submits that the cited art does not teach or suggest the features of claim 321 in combination with the features of claim 309.

For at least the reasons stated above, Applicant further submits that Claims 320 and 321 are patentable over Grow in view of U.S. Patent No. 5,804,451 to Wang et al.

**E. Claim 336 Is Not Unpatentable Over Grow In View of Drexler Pursuant To 35 U.S.C. § 103(a)**

Claim 336 was rejected under 35 U.S.C. § 103(a) as being obvious over Grow in view of U.S. Patent No. 4,588,665 to Drexler (hereinafter “Drexler”). Applicant respectfully disagrees that claim 336 is unpatentable over Grow in view of Drexler.

For at least the reasons stated above, claim 309 is patentable over Grow.

Claim 336 states in part: “wherein the supporting member comprises a dry film photoresist material.” The combination of the cited art does not appear to teach or suggest a supporting member of a sensor array that comprises a dry film photoresist material. For at least the reasons stated above, Applicant respectfully submits that the combination of the cited art does not teach or suggest the features of claim 336 in combination with the features of claim 309.

**F. Claim 340 Is Not Unpatentable Over Grow In View of Wang Pursuant To 35 U.S.C. § 103(a)**

Claim 340 was rejected under 35 U.S.C. § 103(a) as being obvious over Grow in view of U.S. Patent No. 5,804,451 to Wang et al. (hereinafter "Wang"). Applicant respectfully disagrees that claim 340 is unpatentable over Grow in view of Wang.

For at least the reasons stated above, claim 309 is patentable over Grow.

Claim 340 states in part: "further comprising a vacuum apparatus coupled to the sensor array, wherein the vacuum apparatus is configured to pull the fluid through the cavity during use." For at least the reasons stated above, Applicant respectfully submits that the combination of the cited art does not teach or suggest the features of claim 340 in combination with the features of claim 309.

For at least the reasons stated above, Applicant further submits that Grow does not teach or suggest the features of claim 340 in combination with the features of claim 309.

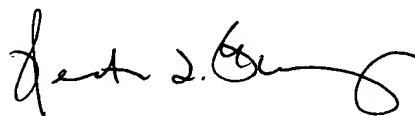
**G. Additional Remarks**

Applicant submits that all claims are in condition for allowance. Favorable reconsideration is respectfully requested.

Applicant believes no fees are required with the filing of this response. If any extension of time is required, Applicant hereby requests the appropriate extension of time.

Inventor: McDevitt et al.  
Appl. Ser. No.: 09/775,343  
Atty. Dkt. No.: 5936-00529

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Heather L. Flanagan", with a stylized flourish at the end.

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